

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions of claims in the application:

Listing of Claims:

1. (Currently Amended): A hydraulic brake module adapted for connection to a brake system for a vehicle having at least four wheels and a hydraulic brake system, each wheel being provided with a respective brake and hydraulic brake actuator, each of the brake actuators being connected to a master cylinder, the master cylinder being actuated by a manually operated brake pedal, at least two of the brake actuators being connected to the master cylinder via a respective one of a first conduit and a second conduit, an ABS unit, including hydraulic components and an electronics module controlling the operation of the hydraulic components of the ABS unit connected to the first conduit and the second conduit being interposed between the at least two brake actuators and the master cylinder to provide at least anti-lock braking functions, comprising which hydraulic brake module adapted for connection to such a brake system comprises:

a body formed separately from the ABS unit and the master cylinder of such a brake system;

a first circuit of pressurized brake fluid formed in said body,

a second circuit of pressurized brake fluid formed in said body, said second circuit having at least one port formed in said body through which said second circuit may be connected with the first conduit of the brake system between the master cylinder and the ABS unit;

a third circuit of pressurized brake fluid formed in said body said third circuit having at least one port formed in said body through which said third circuit may be connected with the second conduit of the brake system between the master cylinder and the ABS unit;

an electrically operated pump mounted on said body, the pump being plumbed to urge brake fluid through said first circuit;

a first fluid separator unit coupled to said first circuit and said second circuit for substantially preventing the intermixing of pressurized brake fluid from said pump in said first circuit with brake fluid in said second circuit, said first fluid separator unit having a moveable pressure boundary which enables, through movement thereof, pressure in said first circuit to be transmitted to said second circuit such that, when said second circuit is connected in communication with the first conduit, and the ABS unit permits, the fluid in said second circuit thus pressurized through the fluid separator unit will actuate the brake actuator connected to the first conduit;

a second fluid separator unit coupled to said first circuit and said third circuit for substantially preventing the intermixing of pressurized brake fluid from said pump in said first circuit with brake fluid in said third circuit, said second fluid separator unit having a moveable pressure boundary which enables, through movement thereof, pressure in said first circuit to be transmitted to said third circuit such that, when said third circuit is connected in communication with the second conduit, and the ABS unit permits, the fluid in said third circuit thus pressurized through the fluid separator unit will actuate the brake actuator connected to the second conduit; and

a proportional valve mounted on said body for selectively controlling the pressure of the brake fluid of said first circuit acting on said first and said second fluid separator units.

2. (Currently Amended): The hydraulic brake module of claim 1 wherein said proportional valve comprises a three-way proportional valve.

3-8. (cancelled)

9. (Currently Amended) A vehicle braking system comprising:
- a first hydraulic brake module, said hydraulic brake module comprising:
- a first circuit of pressurized brake fluid;
 - a second circuit of pressurized brake fluid;
 - a third circuit of pressurized brake fluid;
 - a first set of brake actuators operated by the application of pressurized brake fluid;
 - a second set of brake actuators operated by the application of pressurized brake fluid;
 - a first fluid separator unit coupled to said first circuit and said second circuit for substantially preventing the intermixing of pressurized brake fluid between said first circuit and said second circuit, said first fluid separator unit having a moveable pressure boundary which enables, through movement thereof, said second circuit of pressurized brake fluid to selectively act upon said first set of brake actuators in response to said first circuit of pressurized brake fluid acting upon said first fluid separator unit;
 - a second fluid separator unit coupled to said first circuit and said third circuit for substantially preventing the intermixing of pressurized brake fluid of said first circuit and said third circuit, said second fluid separator unit having a moveable pressure boundary which enables, through movement thereof, said third circuit of pressurized brake fluid to selectively act upon said second set of brake actuators in response to said first circuit of pressurized brake fluid acting upon said second fluid separator unit;
- wherein said first circuit includes a proportional valve for selectively controlling said pressurized brake fluid of said first circuit acting on said first and said second fluid separator units;

a control module for electronically controlling said first brake module;
a second hydraulic brake module, comprising an ABS hydraulic module formed separately from said brake module, containing fluidic components to provide ABS functionality to said first and second sets of wheel brakes; and
an electronic ABS control module for controlling the ABS second hydraulic brake module, said ABS control module communicating with said control module
wherein said first hydraulic brake module and said second hydraulic brake module cooperatively apply a braking torque to said first set and said second set of brake actuators.

10. (cancelled)

11. (Currently Amended) The vehicle braking system of claim 9 wherein said second hydraulic brake module further comprises a traction control module.

12. (Currently Amended) The vehicle braking system of claim 9 wherein said second hydraulic brake module further comprises a vehicle stability control module.

13. (previously presented) The vehicle braking system of claim 9 wherein said proportional valve comprises a three-way proportional valve.

14-30. (cancelled)

31. (Currently Amended) A vehicle braking system for cooperatively applying a portion ofa braking torque in a regenerative braking system, said braking system comprising:

a first hydraulic brake module, said first hydraulic brake module comprising:

a first circuit of pressurized brake fluid, including:

a pump acting as a source of pressurized brake fluid;

a proportional valve with an inlet connected to said pump and having an outlet; and

a relief valve providing overpressure protection to said first circuit;

a second circuit of pressurized brake fluid;

a third circuit of pressurized brake fluid;

a first set of brake actuators operated by the application of pressurized brake fluid;

a second set of brake actuators operated by the application of pressurized brake fluid;

a first fluid separator unit coupled to the outlet of said proportional valve of said first circuit and also coupled to said second circuit for substantially preventing the intermixing of pressurized brake fluid between said first circuit and said second circuit, said first fluid separator unit having a moveable pressure boundary which enables, through movement thereof, said second circuit of pressurized brake fluid to selectively act upon said first set of brake actuators in response to said first circuit of pressurized brake fluid acting upon said movable pressure boundary of said first fluid separator unit;

a second fluid separator unit coupled to the outlet of said proportional valve of said first circuit and also coupled to said third circuit for substantially preventing the intermixing of pressurized brake fluid of said first circuit and said third circuit, said second fluid separator unit having a moveable pressure boundary which enables, through movement thereof, said third circuit of pressurized brake fluid to selectively act upon said second set of brake actuators in response to said first circuit of pressurized brake fluid acting upon said movable pressure boundary of said second fluid separator unit; and
a first electronic control module for receiving sensed signals and controlling operations of said first hydraulic brake module;

~~a separate-second hydraulic brake module, separately formed from said first hydraulic brake module,~~ comprising components providing at least one of an antilock braking function, ~~and a traction control function, a regenerative braking function, a hill hold function, an automated collision avoidance function, a cruise control function, a panic brake assist function, and a vehicle stability control function,~~ said first hydraulic brake module and said second hydraulic brake module cooperatively apply a braking torque to said first set and said second set of brake actuators said second hydraulic brake module including a first fluid conduit connected to said third circuit of pressurized brake fluid, said second hydraulic brake module also including a second fluid conduit connected to said second circuit of pressurized brake fluid and provided with a relief valve for relieving any overpressure condition in said second circuit; and
~~—— a first control module for receiving sensed signals and controlling operations of said first brake module and;~~

a second electronic control module for receiving sensed signals and controlling operations of said second hydraulic brake module.

32 - 33. (cancelled)

34. (Previously Presented) The braking system of claim 31 further comprising a powertrain control module for controlling a regenerative braking portion of the vehicle, said powertrain control module is in communication with said control module and said second control module for cooperatively controlling braking torque to said vehicle.

35. (Currently Amended) A braking system comprising:
a brake pedal unit;
at least one wheel brake;
a first hydraulic brake module, including:

a first body defining a first fluid circuit, said first body also defining a second fluid circuit having an outlet;

a pump having a discharge into said first fluid circuit, an electrically operated valve having an inlet and an outlet, the inlet of said valve being connected to the discharge of said pump, and a first relief valve connected between said pump and the inlet of said valve to provide overpressure protection; and

~~a second fluid circuit including~~ a fluid separator unit disposed in said second fluid circuit, said fluid separator unit having an inlet connected to the outlet of said valve and, said fluid separator unit also being connected, via said an outlet of said second fluid circuit,
~~connected to said brake pedal unit; and to an outlet of said second fluid circuit; and~~

~~a first an~~ electronic control module for controlling the operation of at least said first hydraulic brake module said pump and said electrically operated valve to cause the first hydraulic brake module to selectively supply pressurized hydraulic brake fluid to said outlet of said second fluid circuit; and
a second hydraulic brake module, including:

a second body, separate from said first body, defining a fluid circuit in said second body having an inlet connected to both ~~the~~ said outlet of said second fluid circuit and to the brake pedal unit and being connected to said at least one wheel brake so that pressurized hydraulic brake fluid from said outlet of said second fluid circuit or from said brake pedal unit are selectively allowed to pass through said fluid circuit in said second body to said at least one wheel brake; and

components, including an ABS pump and at least one ABS valve, mounted on said second body providing antilock braking functions for said ~~first~~ at least one wheel brake.

36. (Currently Amended) The brake system of Claim 35, wherein said second hydraulic module further includes a second relief valve for providing overpressure protection to at least a portion of said fluid circuit in said second body.